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## AMENDMENTS TO THE CLAIMS:

Please delete all prior drafts of the claims and substitute in their place the following claims as amended:

1. (Currently Amended) A An *in vitro* method for quantifying the osteoinductive potential of a collection of like implant material intended for implantation into human or non-human recipients in need thereof comprising:

- (a) releasing osteogenic factors *in vitro* from a representative sampling of a collection of like implant materials to produce an implant releasate containing said osteogenic factors; and
- (b) quantifying the concentration of at least one osteogenic factor present in said implant releasate, wherein said quantifying occurs *in vitro* and does not require implantation of said materials *in vivo* or use of complex biological living materials; and
- (c) determining a value of osteogenic potential for said representative sampling by corresponding said concentration of at least one osteogenic factor with a similar value on a predetermined curve;

whereby the osteogenic potential of said collection is realized.

2. (Original) The method according to claim 1, wherein said implant material comprises bone.

3. (Original) The method according to claim 2, wherein said bone implant material comprises autograft, allograft, xenograft, cortical bone, cancellous bone, and combinations thereof.

4. (Original) The method according to claim 3, wherein said releasing of step (a) comprises demineralizing bone implant material to produce a substantially demineralized bone implant matrix; optionally said demineralizing bone implant material comprises reducing calcium concentration to about 2 percent or less.

5. (Original) The method according to claim 4, wherein said releasing further comprises dissolving said demineralized bone implant matrix.
6. (Original) The method according to claim 5, wherein said dissolving comprises contacting said demineralized bone implant matrix with enzymes that do not destroy osteoinductive factors present in said implant releasate, but which dissolve or otherwise dissociate said demineralized bone matrix to produce a dissolved implant releasate.
7. (Original) The method according to claim 6, wherein said enzymes comprise collagenase.
8. (Original) The method according to claim 6, wherein said method further comprises removing particulate debris from said dissolved implant releasate.
9. (Original) The method according to claim 8, wherein said removing comprises centrifuging said dissolved implant releasate and retaining the centrifugation supernatant to provide an implant releasate supernatant.
10. (Original) The method according to claim 9 further comprising removing low molecular weight non-osteogenic factor molecules from said implant releasate supernatant.
11. (Currently amended) The method according to claim 10, wherein said step of removing low molecular weight non-osteogenic factor molecules comprises subjecting said implant releasate to dialyzing, ultrafiltering, size-exclusion fractionating, precipitating, or combinations thereof.
12. (Original) The method according to claim 1, wherein said at least one osteogenic factor comprises at least one mitogen and at least one morphogen.
13. (Original) The method according to claim 1, wherein said at least one osteoinductive factor is selected from the group consisting of bone morphogenetic

proteins, tissue growth factors, fibroblast growth factors, platelet derived growth factors, vascular endothelial growth factors, cartilage derived morphogenetic proteins, insulin-like growth factors, and combinations thereof.

14. (Original) The method according to claim 1, wherein said at least one osteogenic factor is selected from the group consisting of transforming growth factors TGF- $\alpha$ , TGF- $\beta$  bone morphogenic protein BMP-1, BMP-2, BMP-3, BMP-4, BMP-5, BMP-6, BMP-7, BMP-8 and combinations thereof.

15. (Original) The method according to claim 14 wherein said at least one osteogenic factor comprises TGF- $\beta$ 1 plus BMP-2 or BMP-4 or both.

16. (Currently amended) The method according to claim 1, wherein said quantifying step comprises utilizing an immunoassay which detects specific osteoinductive factors present in said implant releasate.

17. (Original) The method according to claim 16, wherein said immunoassay is selected from the group consisting of enzyme-linked immunosorbent assay (ELISA), radioimmunoassay, immunoprecipitation or combinations thereof.

18. (Original) The method according to claim 16 wherein said quantifying comprises contacting said at least one osteogenic factor with an antibody specific thereto under conditions to allow for specific binding of said antibody to said at least one osteogenic factor to occur, and measuring said specific binding of said antibody to said at least one osteogenic factor.

19. (Original) The method according to claim 1, wherein said osteoinductive factors are quantified in the range between pictogram and milligram quantities and multiples and dilutions thereof.

20. (Original) The method according to claim 1, wherein said predetermined curve is established by correlating concentrations of at least one osteogenic factor with the probability of said concentrations to generate bone *in vivo*.

21. (Original) The method according to claim 20, wherein said correlating concentrations of at least one osteogenic factor comprises correlating the product achieved by multiplying a given concentration of TGF- $\beta$ 1 with a concentration of BMP2, BMP4 or both.

22. (Original) The method according to claim 1 wherein said predetermined curve is established by correlating concentration of at least one osteogenic factor with an ability to induce differentiation of undifferentiated cells.

23. (Currently Amended) ~~A~~ An *in vitro* method of measuring the osteogenic potential of an implant comprising:

- (a) releasing osteogenic factors *in vitro* from said implant to produce an implant releasate containing said osteogenic factors;
- (b) quantifying the concentration of at least one osteogenic factor in said implant releasate, wherein said quantifying occurs *in vitro* and does not require implantation of said implant *in vivo* or use of complex biological living materials; and
- (c) determining a value of osteogenic potential for said implant by corresponding said concentration of at least one osteogenic factor with a similar value on a predetermined curve;

whereby the osteogenic potential of said implant is realized.

Claims 24-30 (Cancelled).

31. (Currently Amended) ~~A~~ The method of claim 1, whereby for reducing the need to sacrifice laboratory animals used in bone growth studies is reduced; and further comprising the step of selecting an implant from said collection having[[, wherein the]]

osteoinductive potential of said implant is predetermined by the method of claim 1; and  
implanting said implant into a patient in need thereof.

Claims 32-36 (Cancelled).